REMARKS

In the Official Action of April 22, 2005 the Examiner indicated that claims 1-12 are pending in the Application and rejects claim 1 under 35 U.S.C. § 112, second paragraph, and also objects to claims 1-12 for informalities therein.

With respect to the raised 35 U.S.C. § 112, second paragraph, rejection of claim 1 and the objections to claims 1-12 for the informalities therein, the Applicant respectfully points out that this filing was accompanied by a Preliminary Amendment which canceled original claims 1-12 in favor of new claims 13-24. The Applicant reviewed new claims 13-24 and believes that all of the grounds for objection to claims 1-12, for the informalities noted therein, are suitably addressed and overcome in new claims 13-24. The Applicant therefore respectfully requests that the Examiner reconsider and withdraw all objections to the claims for informalities therein.

With regard to the rejection of claim 1, now claim 25, under 35 U.S.C. § 112, second paragraph, as indefinite for the reasons noted in the official action, the Applicant is rewriting the subject matter of claim 13 as new claim 25 with correspondingly amendments to claims 14-24. It is now believed that the presently pending claims particularly point out and distinctly claim the subject matter regarded as the invention, thereby overcoming all of the raised § 112, second paragraph, rejections. The entered claim amendments are directed solely at overcoming the raised indefiniteness rejection(s) and are not directed at distinguishing the present invention from the art of record in this case. The Applicant therefore respectfully requests that the Examiner reconsider and withdraw all rejections of the claims under 35 U.S.C. § 112, second paragraph.

Next, the Examiner rejects claims 1-12, now claims 14-25, under 35 U.S.C. § 103(a) as unpatentable over Jungreis et al. `461 in combination with Powell et al. `550 and further in combination with De Doncker et al. `195. The Applicant acknowledges and respectfully traverses all of the raised obviousness rejections in view of the following remarks.

First considering the present invention as recited in new independent claim 25, the present invention is directed to power supply system for use in a motor vehicle for providing electrical energy to first and second electric consumers. According to the present invention, as recited in new claim 25, the power supply system includes a primary energy memory for providing electrical energy at a first voltage level to the first energy consumer, a secondary energy memory for providing electrical energy at a second voltage level to the second energy consumer, and a voltage converter connected from the primary energy memory and to the secondary energy memory for receiving electrical energy from the primary energy memory and providing electrical energy to the secondary energy memory. The second voltage level is higher than the first voltage level and the electrical energy provided to the secondary energy memory is stored in the secondary energy memory to be provided to the second energy consumer for a period of time when required.

It will, therefore, be noted that in the present invention, as recited in claim 25, the secondary energy memory provides electrical energy only to the second consumer while the primary energy memory provides power to both the first consumer and the secondary energy memory. It must also be noted that for the power supply of the present invention, the first consumer effectively requires electrical energy on a continuous basis, but at relatively lower levels of consumption, while the second consumer requires higher levels of electrical energy, but not on a continuous basis. The power supply of the present invention thereby employs the primary energy memory to provide a relatively low level of energy to the secondary energy memory on an effectively continuous basis and that energy is stored in the secondary energy memory to be intermittently provided to the second consumer at the required relatively higher levels but only during the relatively shorter periods of time the energy is required by the second consumer.

The present invention, therefore, recognizes that feedback would occur between the secondary energy memory and the primary energy memory if the second voltage level should be drawn below the first voltage level and if, as a result the first voltage level is drawn down

with the second voltage level. Because the second voltage level is higher than the first voltage level, however, and because the secondary energy memory stores sufficient electrical energy to meet the needs of the second consumer during the period of time that the secondary energy memory is required to provided electrical energy to the second consumer, the second voltage level will not fall below the first voltage level during that period so that, as a result, there will not be a feedback from the secondary energy memory to the first energy memory.

Others of the presently pending claims that are dependent from new claim 25 recite, for example, the specific type of voltage converter circuit used in the power supply system and that the secondary energy memory is a capacitor. Yet others of the dependent claims recite that the power supply includes a current throttling element, such as an inductance, in the path from the primary energy memory to the secondary energy memory to further assist in insuring that there will not be feedback from the secondary energy memory to the first energy memory due to the second voltage level being drawn below the first voltage level. Still others of the dependent claims recite, for example, that the power supply includes voltage or current sensors and limiter circuits that limit the flow of current to the voltage converter in the event that the voltage converter and secondary energy memory attempt to draw more current than can be allowed without adversely effecting the power to the first consumer.

Next, considering the prior art references cited by the Examiner, Jungreis '461 describes a power conditioner where power is provided to a single load through a DC to AC converter that receives power from either of two, parallel sources of power, specifically a fuel cell and a battery. The battery further has three paths through which it may provide power to the DC to AC converter, that is, a buck converter, a boost converter and a direct path, wherein each path is characterized by different capabilities in terms of speed of response and levels of power that can be delivered. According to Jungreis '461, power is normally delivered to the DC to AC converter and thus to the single load from the fuel cell, but the battery can provide power to the DC to AC converter when the fuel cell is not capable of providing the needed power, such as when the fuel cell is starting up or when there is a surge demand for power.

It will, therefore, be apparent that there are fundamental distinctions between the teachings of Jungreis `461 and the power supply of the present invention. For example, the Jungreis `461 system provides power to only a single load, and therefore does so at only a single voltage level. That is, the Jungreis `461 system delivers power at only a single voltage level to the single load, regardless of whether the power is being provided from the fuel cell or the battery. In fundamental contrast from the teachings of Jungreis `461, however, the power supply of the present invention, as recited in new claim 25, not only provides power to two different consumers, but at two different voltage levels under two very different sets of power requirements.

In still further fundamental distinction between Jungreis `461 and the present invention, in the Jungreis `461 system the two power supplies, that is, the fuel cell and the battery, are effectively in parallel and both provide power to only the DC to AC converter. Stated another way, the two power sources in Jungreis `461 function as alternatives to one another and are otherwise unrelated.

In the present invention as recited in new claim 25, however, and in complete contrast from Jungreis `461, the primary energy memory provides power to the first consumer and to the voltage converter which, in turn, stores power in the secondary energy memory and provides the stored power to the second consumer, so that the primary energy memory is effectively the source of power for not only the first consumer but also for the second consumer, through the voltage converter and secondary energy memory.

It must also be noted in further fundamental distinction between the present invention and Jungreis `461, that Jungreis `461 does not even address and therefore does not contain any teachings of suggestions relevant to the problem of feedback from the secondary energy memory and second consumer to the primary energy memory and first consumer. It will be recognized that this distinction arises from and is a consequence from the fact that in Jungreis `461 the two power sources are in paralle with one another and operate as alternatives to one another to provide power to only a single load. The Jungreis `461 circuit

configuration thereby will generally not result in a feedback situation, barring some catastrophic failure in one or the other of the power sources, so that the Jungreis `461 system will not and does not address the issue of feedback in any form.

It will, therefore, be recognized by those of ordinary skill in the arts that the circuit configuration of the present invention, as recited in new claim 25, is entirely different from that of the Jungreis `461 system in very fundamental respects. It will also be recognized by those of ordinary skill in the arts that the Jungreis `461 system cannot be adapted or modified to be similar to that of the present invention short of an entire rebuilding of the Jungreis `461 system into a system like the present system through the improper use of hindsight.

It is therefore the belief and position of the Applicant that Jungreis `461 does not and cannot teach or suggest any of the essential aspects of the present invention to those of ordinary skill in the arts under the requirements and provisions of 35 U.S.C. § 103.

Next, considering Powell et al. `550, Powell et al. `550 describes a power supply system wherein an input source is coupled both to a load and to a rechargeable energy reservoir, specifically a battery, that is also coupled to the same load, so that power may be supplied to the load from either the input source or from the battery It should be noted that the coupling of the input source to the load and to the battery and the coupling of the battery to the load are accomplished through a transformer mechanism, which requires converting the AC to DC converted power from the input source and the DC power from the battery to AC power suitable for transformer coupling to the load circuit.

It is there again apparent that there are fundamental distinctions between the present invention and the teachings of Powell et al. `550. For example, and as discussed above with regard to Jungreis `461, the Powell et al. `550 system again delivers power to only a single load and at only a single voltage level rather than delivering power to two different loads at two different voltage levels as in the present invention.

In further fundamental distinction between the present invention and Powell et al. `550, it must be noted that while in Powell et al. `550 the input source is used to charge the battery,

the input source and the battery are, as in Jungreis `461, again essentially coupled in parallel with respect to the load. That is, Powell et al. '550 is again similar to Jungreis `461 in that the input source and the battery are effectively only alternates with respect to one another as regards delivery of power to the load and the input source and the battery do not provide power to separate loads. This is in complete contrast from the present invention, as recited in claim 25, wherein the primary energy memory provides power to the first consumer while the secondary energy memory provides power to the second consumer.

It must also be noted in further fundamental distinction between the present invention and Powell et al. `550 that Powell et al. `550, like Jungreis `461, does not even address and therefore does not contain any teachings of suggestions relevant to the problem of feedback from the secondary energy memory and second consumer to the primary energy memory and first consumer. It will be recognized that as in Jungreis `461, this distinction arises from and is a consequence from the fact that in Powell et al. `550 the two power sources are in parallel with one another with respect to the single load and operate as alternatives to one another to provide power to only that single load. As in Jungreis `461, therefore, the Powell et al. `550 circuit configuration thereby will generally not result in a feedback situation, barring some catastrophic failure in one or the other of the power sources, so that the Powell et al. `550 system will not and does not address the issue of feedback in any form.

It will therefore be recognized by those of ordinary skill in the arts that the circuit configuration of the present invention, as recited in new claim 25, is entirely different from that of the Powell et al. `550 system in very fundamental respects. It will also be recognized by those of ordinary skill in the arts that the Powell et al. `550 system cannot be adapted or modified to be similar to that of the present invention short of an entire rebuilding of the Jungreis `461 system with the improper use of hindsight.

It is therefore the belief and position of the Applicant that Powell et al. '550 does not and cannot teach or suggest any of the essential aspects of the present invention to those of ordinary skill in the arts under the requirements and provisions of 35 U.S.C. § 103.

Now finally considering De Doncker et al. '195, De Doncker et al. '195 describes a system for decoupling the dc voltage level of an energy storage system, that is, a battery, from a DC voltage level provided to a DC to AC converter that, in turn, drives a motor.

It is therefore again apparent that there are fundamental distinctions between the present invention as recited in new claim 25 and the teachings of De Doncker et al. '195. For example, the De Doncker et al. '195 contains only a single power source and provides power to only a single load at only a single voltage level.

In complete contrast from the present invention the De Doncker et al. '195 does not include two power sources, that is, the primary and secondary energy memories, but instead contains only a single power source. In further distinction, the De Doncker et al. '195 system does not provide power to two loads, that is, the first and second consumers, but instead provides power to only a single load, that is, the motor. In addition, the De Doncker et al. '195 system does not provide power to two different loads at two different voltage levels.

More specifically, the De Doncker et al. '195 system does not include a circuit configuration wherein a primary energy memory provides power to a first consumer and to a voltage converter which, in turn, stores power in a secondary energy memory and provides the stored power to a second consumer, so that the primary energy memory is effectively the source of power for not only the first consumer but also for the second consumer, through the voltage converter and secondary energy memory.

In addition, and as a clear consequence of the above distinctions, the De Doncker et al. '195 system does not even address the question of feedback between power sources or from loads to power sources, much less any teachings or suggestions pertaining to the avoidance of such feedback.

In conclusion, therefore, De Doncker et al. '195 stands solely for the proposition that some form of decoupling between a power source and a load can be achieved by a voltage level transformation between the power source and the load. Even in this respect, however, the teachings and suggestions of De Doncker et al. 195 are not relevant to the present

invention as recited in new claim 25. That is, the purpose and function of the De Doncker et al. `195 system is explicitly described as protecting the output voltage level to the DC to AC converter from variations in the input voltage level from the battery.

It is therefore apparent that the purpose and function of the De Doncker et al. `195 system is exactly the opposite of that of the present invention. That is, the purpose and function of the present invention is to shield the first voltage level provided from the primary energy memory and to first consumer from effects due to variations in the second voltage level, that is, the output of the voltage converter, due to variations in the energy provided from the secondary energy memory to the second consumer. Stated another way, the De Doncker et al. `195 system is structured and operates to prevent "feed forward" while the system of the present invention is structured and operates to prevent feedback.

It will therefore be recognized by those of ordinary skill in the arts that the circuit configuration of the present invention as recited in new claim 25 is entirely different from that of the De Doncker et al. `195 system in very fundamental respects. It will also be recognized by those of ordinary skill in the arts that the De Doncker et al. `195 system cannot be adapted or modified to be similar to that of the present invention short of an entire rebuilding of the De Doncker et al. `195 system with the improper use of hindsight.

It is therefore the belief and position of the Applicant that De Doncker et al. `195 does not and cannot teach or suggest any of the essential aspects of the present invention to those of ordinary skill in the arts under the requirements and provisions of 35 U.S.C. § 103.

Therefore considering the combination of Jungreis et al. `461 in combination with Powell et al. `550 and further in combination with De Doncker et al. `195, it is apparent that each of Jungreis et al. `461, Powell et al. `550 and De Doncker et al. `195 lack essential and fundamental teachings of the present invention as recited in new claim 25. For example, none of Jungreis et al. `461, Powell et al. `550 or De Doncker et al. `195 in any way teach or suggest a system for providing two different voltage and power levels to two different loads, or consumers, each having different power and voltage level requirements. In fundamental

contrast from the present invention, Jungreis et al. `461, Powell et al. `550 and De Doncker et al. `195 each teach only a system for providing a power at a single voltage level to a single load.

In addition, even when one of the references teaches a system containing two power sources, such as Jungreis et al. `461 and Powell et al. `550, those power sources are effectively and functionally connected in parallel to the load so that each operates as an alternate power source to the other. In the present system, and in fundamental contrast from Jungreis et al. `461 and Powell et al. `550, the two power sources in the system of the present invention are effectively and functionally connected in sequence so that the primary energy memory provides power to the secondary energy memory as well as to the first consumer.

As a consequence of the above, none of Jungreis et al. `461, Powell et al. `550 or De Doncker et al. `195 teach or suggest a system wherein a primary energy memory provides power to a first consumer and to a voltage converter, which in turn stores power in a secondary energy memory and provides the stored power to a second consumer, so that the primary energy memory is effectively the source of power for not only the first consumer but also for the second consumer through the voltage converter and secondary energy memory.

In still further fundamental distinction between the present invention and the teachings of Jungreis et al. `461, Powell et al. `550 and De Doncker et al. `195, none of Jungreis et al. `461, Powell et al. `550 or De Doncker et al. `195 teach or suggest a system preventing feedback from a secondary energy source and a second consumer powered by that secondary energy source to a first energy source and first consumer, or any other form of preventing the effects of a load on a power source. As discussed, the only reference that even considers any form of interaction between a power source and a load is De Doncker et al. `195, which operates in the reverse from the system of the present invention. That is, De Doncker et al. `195 prevent variations in the energy source voltage levels from effecting the voltage levels delivered to the load. In complete contrast, the system of the present invention as recited in new claim 25 prevents variations in the power drawn by a load from effecting the voltage

delivered by the power source, and in particular from effecting the voltage delivered to another load.

Considering, however, the possible combination of Jungreis et al. '461, Powell et al. '550 and De Doncker et al. '195 solely for purposes of discussion and without any admission, agreement or acknowledgment that such as combination would be reasonable, or even possible, it is apparent that the best combination of these references could not teach or suggest the present invention. For example, and for these purposes ignoring the fundamental mutual incompatibilities of the three systems, the combination could employ the fuel cell and battery of Jungreis et al. '461 with the battery being charged from the fuel cell in the manner of the input source and battery of Powell et al. '550 and with the decoupling circuit of De Doncker et al. '195 interposed between the fuel cell and battery combination and the load.

The resulting combination, however, would still not teach or suggest the present invention as recited in new claim 25. For example, the combination would provide only power at a single voltage level to a single load while, in complete contrast, the system of the present invention provides two different voltage and power levels to two different loads, or consumers, each having different power and voltage level requirements.

In addition and as discussed previously, even though the combination would have two power sources, that is, the fuel cell and a battery the power sources would be effectively and functionally connected in parallel to the load so that each only operates as an alternate power source to the other. In fundamental contrast from the combination, the two power sources in the system of the present invention are effectively and functionally connected in sequence so that the primary energy memory provides power to the secondary energy memory as well as to the first consumer.

As a consequence of the above, the combination would not and could not teach or even suggest a system according to the present invention wherein a primary energy memory provides power to a first consumer and to a voltage converter, which in turn stores power in a secondary energy memory and provides the stored power to a second consumer, so that the

primary energy memory is effectively the source of power for not only the first consumer but also for the second consumer, through the voltage converter and secondary energy memory.

In still further fundamental distinction between the present invention and the combination, even the inclusion of De Doncker et al. `195 would not teach or suggest a system preventing feedback from a secondary energy source and a second consumer powered by that secondary energy source to a first energy source and first consumer, or any other form of preventing the effects of a load on a power source. As discussed, De Doncker et al. `195, which operates in the reverse from the system of the present invention to prevent variations in the energy source voltage levels from effecting the voltage levels delivered to the load. In complete contrast, the system of the present invention as recited in new claim 25 prevents variations in the power drawn by a load from effecting the voltage delivered by the power source, and in particular from effecting the voltage delivered to another load.

In conclusion, therefore, it is the belief and position of the Applicant that for the reasons discussed above none of Jungreis et al. `461 or Powell et al. `550 or De Doncker et al. `195 or the combination of Jungreis et al. `461 in combination with either Powell et al. `550 and/or De Doncker et al. `195 in any way teaches or suggests the present invention as recited in new claim 25 to those of ordinary skill in the arts under the requirements and provisions of 35 U.S.C. § 103. The Applicant therefore respectfully requests that the Examiner reconsider and withdraw all rejections of claim 25 under 35 U.S.C. 103 over the cited prior art, and allow claim 25.

In addition, claims 14-24 are all directly or indirectly dependent from claim 25 and thereby incorporate all recitations and limitations of claim 25 so that claims 14-24 are fully and patentably distinguished over and from the teachings of Jungreis et al. `461, Powell et al. `550 and/or De Doncker et al. `195 under the requirements and provisions of 35 U.S.C. § 103. The Applicant, therefore, respectfully requests that the Examiner reconsider and withdraw all rejections of claims 14-24 over the prior art, and allow claims 14-24 as well.

If any further amendment to this application is believed necessary to advance prosecution and place this case in allowable form, the Examiner is courteously solicited to contact the undersigned representative of the Applicant to discuss the same.

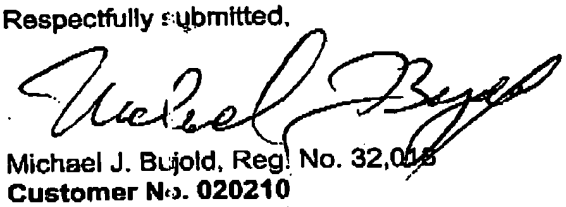
In view of the above amendments and remarks, it is respectfully submitted that all of the raised rejection(s) should be withdrawn at this time. If the Examiner disagrees with the Applicant's view concerning the withdrawal of the outstanding rejection(s) or applicability of the Jungreis et al. `461, Powell et al. `550 and/or De Doncker et al. `195 references, the Applicant respectfully requests the Examiner to indicate the specific passage or passages, or the drawing or drawings, which contain the necessary teaching, suggestion and/or disclosure required by case law. As such teaching, suggestion and/or disclosure is not present in the applied references, the raised rejection should be withdrawn at this time. Alternatively, if the Examiner is relying on his/her expertise in this field, the Applicant respectfully requests the Examiner to enter an affidavit substantiating the Examiner's position so that suitable contradictory evidence can be entered in this case by the Applicant.

In view of the foregoing, it is respectfully submitted that the raised rejection(s) should be withdrawn and this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

The Applicant respectfully requests that any outstanding objection(s) or requirement(s), as to the form of this application, be held in abeyance until allowable subject matter is indicated for this case.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,



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